

IN THE CLAIMS:

Please amend the claims to read as follows:

Claim 1 (Currently Amended): A pattern forming method comprising:

forming an etching-subject layer on a substrate;

forming a Ti layer on the etching-subject layer;

forming a TiOx layer by irradiating light on a portion of the Ti layer using a mask;

etching the Ti layer to remove remaining Ti metal portions of the Ti layer to form a

TiOx pattern;

etching the etching-subject layer using the TiOx pattern as a mask; and

removing the TiOx pattern.

Claim 2 (Original): The method of claim 1, wherein the light is an ultraviolet ray or laser.

Claim 3 (Original): The method of claim 1, wherein the Ti layer is oxidized by the irradiation of the light to form the TiOx layer.

Claim 4 (Original): The method of claim 1, wherein etching the Ti layer includes applying an etching solution having an acid.

Claim 5 (Original): The method of claim 4, wherein the acid includes HF.

Claim 6 (Withdrawn): The method of claim 1, wherein etching the Ti layer includes the applying an etching gas containing Cl₂.

Claim 7 (Withdrawn): The method of claim 1, wherein etching the Ti layer includes applying the etching gas includes a Cl₂-mixed gas.

Claim 8 (Withdrawn): The method of claim 7, wherein the Cl₂-mixed gas includes CF₄/Cl₂/O₂ gas.

Claim 9 (Currently Amended): The method of claim 1, wherein removing the TiOx pattern includes applying ~~the~~ an etching solution having H₂SO₄.

Claim 10 (Withdrawn): The method of claim 1, wherein removing the TiOx pattern includes applying an alkali based etching solution.

Claim 11 (Withdrawn): The method of claim 1, wherein removing the TiOx pattern includes applying the etching gas including Cl₂/N₂ gas.

Claim 12 (Withdrawn): The method of claim 1, wherein removing the TiOx pattern includes applying the etching gas including CF₄/Cl₂.

Claim 13 (Original): The method of claim 1, wherein the etching-subject layer is one of a metal layer, an insulating layer and a semiconductor layer.

Claim 14 (Original): The method of claim 1, wherein the Ti layer is formed with the same equipment as the etching-subject layer.

Claim 15 (Currently Amended): A pattern forming method comprising:
forming an etching-subject layer on a substrate;
forming a Ti layer on the etching-subject layer;
oxidizing a portion of the Ti layer to form ~~an~~ TiOx ~~pattern~~ portions;
removing remaining Ti metal portions of the Ti layer to form a TiOx pattern;
etching the etching-subject layer using the TiOx pattern as a mask; and
removing the TiOx pattern.

Claim 16 (Original): The method of claim 15, wherein oxidizing a portion of the Ti layer includes irradiating light onto the Ti layer using a mask.

Claim 17 (Original): The method of claim 16, wherein the light is one of ultraviolet light and laser.

Claim 18 (Original): A pattern forming method comprising:

forming an etching-subject layer on a substrate;
forming a TiO₂ layer including a first region and a second region on the etching-subject layer;
irradiating light onto the first region of the TiO₂ layer using a mask;
etching the second region of the TiO₂ layer;
etching the etching-subject layer using the first region of the TiO₂ layer as a mask; and
removing the first region of the TiO₂ layer.

Claim 19 (Original): The method of claim 18, wherein forming the TiO₂ layer includes depositing TiO₂ on the etching-subject layer.

Claim 20 (Original): The method of claim 18, wherein forming the TiO₂ layer includes:
depositing Ti on the etching-subject layer to form a Ti layer; and
oxidizing the Ti layer.

Claim 21 (Original): The method of claim 20, wherein the Ti layer is oxidized by irradiation of light.

Claim 22 (Original): The method of claim 18, wherein the light is ultraviolet light or laser.

Claim 23 (Currently Amended): The method of claim 18, wherein ~~the hydrophobic a~~ surface of the first region of the TiO₂ layer is changed from hydrophobic to be hydrophilic ~~one~~ by the irradiation of the light.

Claim 24 (Original): The method of claim 18, wherein etching the second region of TiO₂ layer includes applying an etching solution including H₂SO₄ to the TiO₂ layer.

Claim 25 (Withdrawn): The method of claim 18, wherein etching the second region of TiO₂ layer includes applying an alkali based etching solution to the TiO₂ layer.

Claim 26 (Withdrawn): The method of claim 18, wherein removing the first region of TiO₂ layer includes applying an etching gas having Cl₂/N₂ gas to the first region of the TiO₂ layer.

Claim 27 (Withdrawn): The method of claim 18, wherein removing the first region of TiO₂ layer includes applying the etching gas having CF₄/Cl₂ gas to the first region of TiO₂ layer.

Claim 28 (Original): The method of claim 18, wherein the etching-subject layer includes one of a metal layer, an insulating layer and a semiconductor layer.

Claim 29 (Original): The method of claim 18, wherein the TiO₂ layer is formed using the same equipment used for forming the etching-subject layer.

Claim 30 (Original): A pattern forming method comprising:

- forming an etching-subject layer on a substrate;
- forming a TiO_x layer on the etching-subject layer;
- changing a surface of the TiO_x layer from hydrophobic to hydrophilic such that the TiO_x layer has a hydrophobic surface and a hydrophilic surface;
- etching a portion of TiO_x layer having a hydrophobic surface to form a hydrophilic TiO_x pattern;
- etching the etching-subject layer using the hydrophilic TiO_x pattern as a mask; and
- removing the hydrophilic TiO_x pattern.

Claim 31 (Original): The method of claim 30, wherein changing a surface of the TiO_x layer includes irradiating light onto the TiO_x layer.

Claim 32 (Original): The method of claim 31, wherein the light includes one of ultraviolet and laser.

Claim 33 (Original): A pattern forming method comprising:

- providing an etching-subject layer;
- forming a metal layer on the etching-subject layer;
- oxidizing a portion of the metal layer to form a metallic oxide layer portion and non-oxidized metal layer portion;

removing the non-oxidized metal layer portion using a first etching means;
etching the etching-subject layer using the metallic oxide layer as a mask; and
etching the metallic oxide layer using a second etching means.

Claim 34 (Original): The method of claim 33, wherein the metal layer includes a Ti.

Claim 35 (Original): The method of claim 34, wherein the metallic oxide layer portion includes TiOx.

Claim 36 (Original): The method of claim 33, wherein the first etching means is an etching solution having a higher etching rate on the non-oxidized metal layer portion than on the metallic oxide layer portion.

Claim 37 (Withdrawn): The method of claim 33, wherein the first etching means is an etching gas having a higher etching rate on the non-oxidized metal layer portion than on the metallic oxide layer portion.

Claim 38 (Original): The method of claim 33, wherein the second etching means is an etching solution having a higher etching rate on the metallic oxide layer portion than on the non-oxidized metal layer portion.

Claim 39 (Withdrawn): The method of claim 33, wherein the second etching means is an etching gas having a higher etching rate on the metallic oxide layer portion than on the non-oxidized metal layer portion.

Claim 40 (Original): A method for fabricating a liquid crystal display device, the method comprising:

- providing a substrate;
- forming a gate electrode on the substrate using a first metal masking layer;
- depositing a gate insulating layer over the substrate;
- forming a semiconductor layer on the gate insulating layer using a second metal masking layer;
- forming source/drain electrodes on the semiconductor layer using a third metal masking layer;
- forming a passivation layer over the substrate; and
- depositing a pixel electrode on the passivation layer.

Claim 41 (Original): The method of claim 40, wherein the first, second and third metal masking layers are each comprised of Ti.

Claim 42 (Original): The method of claim 41, wherein forming the gate electrode includes the steps of:

- forming a metal layer on the substrate;

forming the first metal masking layer made of Ti on the metal layer;
irradiating light onto a portion of the first metal masking layer using a mask to form a
TiOx masking layer portion and a Ti masking layer portion;
etching the Ti masking layer portion;
etching the metal layer using the TiOx masking layer portion as a mask; and
removing the TiOx masking layer portion.

Claim 43 (Original): The method of claim 41, wherein forming the semiconductor layer
includes:

depositing the semiconductor layer on the gate insulating layer;
forming the second metal masking layer made of Ti on the semiconductor layer;
irradiating light onto a portion of the second metal masking layer using a mask to form a
TiOx masking layer portion and a Ti masking layer portion;
etching the Ti masking layer portion;
etching the semiconductor layer using the TiOx masking layer portion as a mask; and
removing the TiOx masking layer portion.

Claim 44 (Original): The method of claim 41, wherein forming the source/drain
electrode includes:

forming a metal layer on the semiconductor layer;
forming the third metal masking layer made of Ti on the metal layer;

irradiating light to a portion of the metal masking layer using a mask to form a TiOx masking layer portion and a Ti masking layer portion;
etching the Ti masking layer portion;
etching the metal layer using the TiOx masking layer portion as a mask; and
removing the TiOx masking layer portion.

Claim 45 (Original): The method of claim 40, wherein depositing the pixel electrode includes:

forming an Indium Tin Oxide layer on the passivation layer;
forming a fourth metal masking layer made of Ti on the Indium Tin Oxide layer;
irradiating light to a portion of the metal masking layer by using a mask to form a TiOx masking layer portion and a Ti masking layer portion;
etching the Ti masking layer portion;
etching the Indium Tin Oxide layer using the TiOx masking layer portion as a mask;
and
removing the TiOx masking layer portion.

Claim 46 (Original): The method of claim 40, wherein the first, second and third metal masking layers are each comprised of TiO₂.

Claim 47 (Original): The method of claim 46, wherein forming the gate electrode includes:

forming a metal layer on the substrate;

forming the first metal masking layer made of TiO_2 on the metal layer;

irradiating light onto a portion of the TiO_2 layer to change a surface of the TiO_2 layer from hydrophobic to hydrophilic such that the TiO_2 layer has a hydrophobic surface and a hydrophilic surface;

etching a portion of TiO_2 layer having a hydrophobic surface to form a hydrophilic TiO_2 pattern;

etching the metal layer using the hydrophilic TiO_2 pattern as a mask; and

removing the hydrophilic TiO_2 pattern.

Claim 48 (Original): The method of claim 46, wherein forming the semiconductor layer includes:

depositing the semiconductor layer on the insulating layer;

forming the metal masking layer made of TiO_2 on the semiconductor layer;

irradiating light onto a portion of the TiO_2 layer to change a surface of the TiO_2 layer from hydrophobic to hydrophilic such that the TiO_2 layer has a hydrophobic surface and a hydrophilic surface;

etching a portion of TiO_2 layer having a hydrophobic surface to form a hydrophilic TiO_2 pattern;

etching the semiconductor layer using the hydrophilic TiO_2 pattern as a mask; and

removing the hydrophilic TiO_2 pattern.

Claim 49 (Original): The method of claim 46, wherein forming the source/drain electrodes includes:

- forming a metal layer on the semiconductor layer;
- forming the metal making layer made of TiO_2 on the metal layer;
- irradiating light onto a portion of the TiO_2 layer to change a surface of the TiO_2 layer from hydrophobic to hydrophilic such that the TiO_2 layer has a hydrophobic surface and a hydrophilic surface;
- etching a portion of TiO_2 layer having a hydrophobic surface to form a hydrophilic TiO_2 pattern;
- etching the metal layer using the hydrophilic TiO_2 pattern as a mask; and
- removing the hydrophilic TiO_2 pattern.

Claim 50 (Original): The method of claim 46, wherein depositing the pixel electrode includes:

- forming an indium tin oxide layer on the passivation layer;
- forming the fourth metal making layer made of TiO_2 on the ITO layer;
- irradiating light onto a portion of the TiO_2 layer to change a surface of the TiO_2 layer from hydrophobic to hydrophilic such that the TiO_2 layer has a hydrophobic surface and a hydrophilic surface;
- etching a portion of TiO_2 layer having a hydrophobic surface to form a hydrophilic TiO_2 pattern;
- etching the Indium Tin Oxide layer using the hydrophilic TiO_2 pattern as a mask; and

removing the hydrophilic TiO₂ pattern.

Claim 51 (Currently Amended): A method for fabricating a semiconductor device, the method comprising:

depositing an insulating layer on a semiconductor substrate;

forming a metal layer on the insulating layer;

forming a Ti layer on the metal layer;

irradiating light onto a portion of the ~~second metal masking~~ Ti layer using a mask to form a TiO_x masking layer portion and a Ti masking layer portion;

etching ~~TiO_x~~ the Ti layer to remove the Ti masking layer portion to form a TiO_x pattern as a mask;

etching the metal layer using the TiO_x pattern and removing the TiO_x pattern to form a gate electrode; and

introducing ions to the semiconductor substrate to form source/drain regions.

Claim 52 (Original): The method of claim 51, wherein the ions are introduced through the insulating layer.

Claim 53 (Original): The method of claim 51, wherein etching the metal layer includes simultaneously etching of the insulating layer together with metal layer.

Claim 54 (Original): The method of claim 53, wherein the ions are introduced directly into the semiconductor substrate.

Claim 55 (Original): A method for fabricating a semiconductor device, the method comprising:

depositing an insulating layer on a semiconductor substrate;

forming a metal layer on the insulating layer;

forming a TiO₂ layer on the metal layer;

irradiating light onto a portion of the TiO₂ layer to change a surface of the TiO₂ layer from hydrophobic to hydrophilic such that the TiO₂ layer has a hydrophobic surface and a hydrophilic surface;

etching a portion of TiO₂ layer having a hydrophobic surface to form a hydrophilic TiO₂ pattern;

etching the metal layer using the hydrophilic TiO₂ pattern as a mask to form a gate electrode; and

introducing ions to the semiconductor substrate to form source/drain regions.